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Mar 6, 1980

DERWENT-ACC-NO: 1980-18767C  
DERWENT-WEEK: 198011  
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TITLE: Embossed nonwoven dust cloth or mop - contains random discontinuous microfibres  
and crimped macro:fibres

INVENTOR: JACQUES, R C

PATENT-ASSIGNEE:

ASSIGNEE

MINNESOTA MINING CO

CODE

MINN

PRIORITY-DATA: 1978US-0935255 (August 21, 1978)

## PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
DE 2934009 A	March 6, 1980		000	
BR 7905341 A	May 13, 1980		000	
CA 1109654 A	September 29, 1981		000	
CH 644005 A	July 13, 1984		000	
FR 2434224 A	April 25, 1980		000	
GB 2031039 A	April 16, 1980		000	
GB 2031039 B	January 12, 1983		000	
IT 1120523 B	March 26, 1986		000	

INT-CL (IPC): A47L 13/16; D04H 1/54

ABSTRACTED-PUB-NO: DE 2934009A

## BASIC-ABSTRACT:

In an embossed, non-woven cloth of nonwoven sheet-material, the sheet material in non-embossed condition is 1 (1-30) mm thick and contains random discontinuous microfibres which are self-fusing under local pressure and have average dia.  $\leq 10 \mu$ . The cloth is embossed in a regular pattern of lines which make up 2-40% of its total surface, to bond the fibres where they contact one another without identity loss of the individual fibres. In the embossed condition, the cloth has a elongation  $\geq 25\%$  at max. tear tension.

The nonwoven sheet material pref. contains up to 70 wt. % crimped macrofibres having 5-100 dtex/100 pts. wt. total micro- and macro-fibres.

The cloth is used esp. in disposable dust-cloth or floor mop prodn. The material is sufficiently cohesive to have adequate service-life. is drapable and absorbs dust off hard smooth and other surfaces. The macrofibres consist of polyesters, acrylic resin, polyolefin, polyamide, rayon or polyacrylate, and the microfibres of polypropylene, polyethylene, polyethylene terephthalate or polyamide.

TITLE-TERMS: EMOSS NONWOVEN DUST CLOTH MOP CONTAIN RANDOM DISCONTINUE MICROFIBRE CRIMP  
MACRO FIBRE

ADDL-INDEXING-TERMS:

POLYESTER POLYAMIDE POLYACRYLIC RESIN POLYOLEFIN POLYACRYLATE POLYPROPYLENE@  
POLYETHYLENE@ PET POLYETHYLENE TEREPHTHALATE

DERWENT-CLASS: A18 A23 A94 F04 P28

CPI-CODES: A12-D04; A12-S05G; F02-C01; F02-C02B; F04-B; F04-E;

POLYMER-MULTIPUNCH-CODES-AND-KEY-SERIALS:

Key Serials: 0231 0232 0239 0248 0374 0486 1283 1291 1319 1450 1462 1723 1982 2454 2479  
2486 2496 2528 2529 2530 2569 2628 2634 2653 2658 2659 2763 2820

Multipunch Codes: 011 04- 041 046 047 050 072 074 076 081 141 143 144 155 157 160 163  
166 169 170 171 206 207 252 253 32& 454 466 468 481 483 484 485 532 533 551 560 566 567  
572 575 595 597 599 600 641 664 665 688 720

# WEST Search History

DATE: Wednesday, July 16, 2003

## Set Name Query

side by side

## Hit Count Set Name

result set

*DB=USPT; PLUR=YES; OP=ADJ*

L26	(dtex or decitex or deci tex) and l25	29	L26
L25	l23 and L24	438	L25
L24	wiper or wipe or wipes	43915	L24
L23	staple same l8	4758	L23
L22	4853281.pn.	1	L22
L21	4906513.pn.	1	L21
L20	5350624.pn.	1	L20
L19	5498463.pn.	1	L19
L18	5508102.pn.	1	L18
L17	5512358.pn.	1	L17
L16	5542566.pn.	1	L16
L15	6028018.pn.	1	L15

*DB=DWPI; PLUR=YES; OP=ADJ*

L14	6028018.pn.	1	L14
L13	fleece and (wipe or wiper or towel)	68	L13

*DB=USPT; PLUR=YES; OP=ADJ*

L12	bonded fleece and (wipe or towel\$ or absorb\$)	14	L12
L11	l9 and l10	54	L11
L10	clean\$ or scrub\$ or wipe or towel\$	452609	L10
L9	l7 and l8	160	L9
L8	(cotton or rayon or pulp or cellulos\$)	256827	L8
L7	l5 same l6	302	L7
L6	thermoplastic or synthetic or polymeric or polymer	690455	L6
L5	dtex same (length or mm)	1343	L5
L4	(cotton or rayon or pulp) same (thermoplastic) same dtex same mm	4	L4

*DB=DWPI; PLUR=YES; OP=ADJ*

L3	(cotton or rayon or pulp) and absorb\$ and dtex and mm	5	L3
L2	(cotton or rayon or pulp) and thermoplastic and dtex and length	2	L2
L1	cellulos\$ and thermoplastic and dtex and length	4	L1

END OF SEARCH HISTORY

# WEST Search History

DATE: Wednesday, July 16, 2003

**Set Name Query**

side by side

**Hit Count Set Name**

result set

*DB=USPT; PLUR=YES; OP=ADJ*

L10 18 and L9 27 L10

L9 ((428/904)!.CCLS. ) 671 L9

L8 polyethylene oxide or polypropylene oxide 23899 L8

L7 15 and L6 3224 L7

L6 polyethylene glycol 96409 L6

L5 polyalkylene oxide 7496 L5

*DB=DWPI; PLUR=YES; OP=ADJ*

L4 6448462 1 L4

*DB=USPT; PLUR=YES; OP=ADJ*

L3 11 and 12 71 L3

L2 clean\$ or scrub\$ 434590 L2

L1 ((428/85)!.CCLS. ) 446 L1

END OF SEARCH HISTORY

**PATENT ABSTRACTS OF JAPAN**(11)Publication number : **2000-212866**(43)Date of publication of application : **02.08.2000**

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**// A61F 13/53**  
**A61F 13/15**

(21)Application number : **11-310863**(71)Applicant : **CHISSO CORP**(22)Date of filing : **01.11.1999**

(72)Inventor : **IWATA MASUO**  
**NISHIO HIROAKI**  
**NAKAI NORIHIRO**

(30)Priority

Priority number : **10331252** Priority date : **20.11.1998** Priority country : **JP****(54) HEAT BONDING CONJUGATE FIBER, FIBER ASSEMBLY AND NONWOVEN FABRIC USING THE ASSEMBLY**

(57)Abstract:

PROBLEM TO BE SOLVED: To obtain a bulky nonwoven fabric firmly bonding to cellulosic fiber hardly causing release from adhesive surface or falling of fiber from nonwoven fabric when a heat bonding conjugate fiber is mixed with cellulosic fiber and both fibers are bonded by heating and used as a nonwoven fabric.

SOLUTION: This heat bonding conjugate fiber is combinedly used with a cellulosic fiber. The heat bonding conjugate fiber is obtained by conjugating a modified polyolefin (having 0.05-2 mol/kg) obtained by subjecting a vinyl monomer (hereinafter referred to as a modifier) containing at least one kind of compound selected from unsaturated carboxylic acids and unsaturated carboxylic acid anhydrides to graft polymerization as a first component with a second component comprising a resin having higher melting point than the first component so that the first component continuously forms at least a part to fiber surface in longitudinal direction. The heat bonding conjugate fiber has 0.5-50 denier single yarn fineness, 3-25 mm fiber length and 5-30 number of crimps.

**LEGAL STATUS**

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

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**DETAILED DESCRIPTION**

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[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates to the good polyolefine system bicomponent fiber, the fiber aggregate, and the nonwoven fabric of a heat adhesive property with a cellulosic fiber. It is related with the fiber aggregate or a nonwoven fabric using the polyolefine system bicomponent fiber which the adhesive property of a cellulosic fiber, for example, pulp etc., is size in case it mixes with cotton with a cellulosic fiber and uses, exfoliation or omission of a cellulosic fiber cannot take place easily, and gives in more detail the nonwoven fabric which is the size of specific volume in bulky, and it etc.

[0002]

[Description of the Prior Art] As a heat adhesive property bicomponent fiber using crystalline polypropylene, what was obtained by carrying out melting compound spinning of crystalline polypropylene and the polyethylene as a compound component is known conventionally. After making Webb, as for such a conventional heat adhesive property bicomponent fiber, usually form, although each fiber contact section of Webb welds by heating below by the melting point of the polypropylene component of a high-melting point beyond the melting point of the polyethylene component of the low melting point and a nonwoven fabric is formed, such a nonwoven fabric has a weak adhesive property with other heterogeneous material, such as cloth, wood, or a metal. Therefore, when using the above nonwoven fabrics, making other heterogeneous materials paste or forming composite material as a nonwoven fabric layered product combining other materials, it is necessary to newly use a binder. Moreover, even when a binder is used temporarily, the adhesive property is not necessarily good.

[0003] In order to improve these troubles in recent years, it is considering as heat adhesive property fiber using the polyolefine which used the polymer containing an ethylene vinylacetate copolymer or its saponification object for one component of a bicomponent fiber, or denaturalized by (JP,53-126320,A), the unsaturated carboxylic acid, its metal salt, or the unsaturation carvone acid anhydride (JP,54-30929,A). When mixing with cotton with pulp and using these heat adhesive property fiber as a nonwoven fabric, the paper-making method by the wet method is learned (JP,54-30929,A). However, when based on a wet method, specific volume is smallness and the obtained nonwoven fabric is firmly inferior in feeling. In recent years, development of the nonwoven fabric which was excellent in uses, such as hygienic goods, bulky at feeling was demanded. Moreover, it was difficult to perform processing exfoliation or omission in processing should produce and it should be satisfied [ with hydrophilic fiber like a polyolefin fiber and a cellulosic fiber ] of processing since both compatibility is inferior in mixture by dry process, such as the carding method performed from the former.

[0004]

[Problem(s) to be Solved by the Invention] The purpose of this invention examines developing a specific polyolefine system heat adhesive property bicomponent fiber and its processing method, in order to paste up firmly with a cellulosic fiber, to be in obtaining the bulky nonwoven fabric to which omission of fiber cannot take place from the exfoliation or the nonwoven fabric from an adhesion side easily and to attain the purpose, in case mix with cotton with a cellulosic fiber, it is made to heat and paste up and it uses as a nonwoven fabric.

[0005] In order to attain the above-mentioned purpose, as a result of repeating research wholeheartedly, this invention persons know that it is effective to heat-treat the fiber aggregate which mixed with cotton by the air RAID method, and was obtained in the heat adhesive property bicomponent fiber and cellulosic fiber using the specific polyolefine mentioned later by the specific method, and came to complete this invention.

[0006] Furthermore, the polyoxyethylene alkyl ether of specification [ the front face of the heat adhesive property bicomponent fiber of this invention ], By making the fiber processing agent which consists of the specific 4th class ammonium phosphate salt or a specific specific polyorganosiloxane adhere to a fiber front face Furthermore, by making the fiber processing agent which contains these compounds by the specific ratio preferably adhere to a fiber front face at a specific rate Reduction and opening nature of friction of a fiber front face become good, consequently the dispersibility of heat adhesive property fiber and a cellulosic fiber improves, and uniform adhesion is brought about among both fiber. Therefore, it knows that exfoliation or omission of a cellulosic fiber will be prevented from a nonwoven fabric, and the good nonwoven fabric of initial absorptance can be obtained, and came to complete this invention.

[0007]

[Means for Solving the Problem] By this invention which takes the following composition, it succeeded in solving the aforementioned technical problem.

It is fiber which uses together with a cellulosic fiber and is used. this fiber (1) A unsaturated carboxylic acid, Or the conversion polyolefine (a denaturant content is 0.05-2 mols/kg) by which graft polymerization was carried out by the vinyl monomer (these may be called denaturant below) containing at least one sort chosen from the unsaturation carvone acid anhydride is used as the 1st component. The heat adhesive property bicomponent fiber which the 2nd component which consists of a resin with the melting point higher than the 1st component is allotted to composite, and this 1st component continues and forms a part of fiber front face [ at least ] in the length direction, and are the single-yarn fineness of 0.5-50 deniers, the fiber length of 3-25mm, and 5-30 crimps.

(2) A heat adhesive property bicomponent fiber given in (1) term in which a denaturant contains one or more sorts of a maleic anhydride, an acrylic acid, or a methacrylic acid.

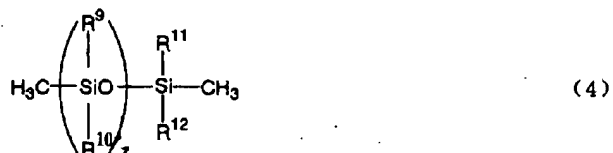
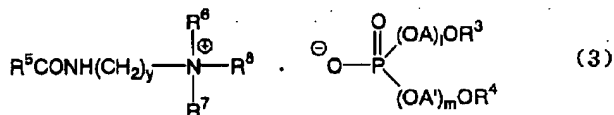
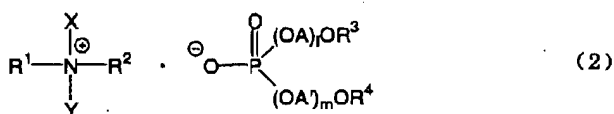
(3) A heat adhesive property bicomponent fiber given in (1) term which a denaturant becomes from a maleic anhydride and styrene.

(4) A heat adhesive property bicomponent fiber given in (1) term to which a denaturant serves as a maleic anhydride from one or more sorts of an acrylic ester or a methacrylic ester.

[0008] (5) A component which consists of polyoxyethylene alkyl ether shown by the following general formula (1), B component which consists at least of the 4th class ammonium phosphate salt of a kind of chosen from the group which consists of a salt shown by the following general formula (2) and the following general formula (3), And a heat adhesive property bicomponent fiber given in either of the (1) - (4) terms which adhered to at least 1 component of A, B, and the C components in the fiber processing agent which consists of a C component which consists of a polyorganosiloxane shown by the following general formula (4).

[0009]

[Formula 2]



[0010] R shows the hydrocarbon group of carbon numbers 12-30 among {formula, and; x are the integer of 10-50.

respectively; R1 and R3 independently The alkyl group of carbon numbers 5-18, Or an ARUKENIRU machine Example; R2, R6, R7 Respectively R8 independently and the alkyl group of carbon numbers 1-3 R4 Example; Hydrogen Or the alkyl group or ARUKENIRU machine of carbon numbers 5-18 example; -- the basis R5 indicates the alkyl group or ARUKENIRU machine of carbon numbers 7-17 to be; X indicates the basis shown by the alkyl group of carbon numbers 1-3, or H(OA) q- to be, and; Y is indicated to be by the alkyl group of carbon numbers 1-3, or H(OA') r- being shown --; -- every -- A It reaches and A' each expresses an ethylene or a propylene machine independently respectively. (OA) q, r, the basis which (OA) l and (OA') m become from the repeat structure of an oxyethylene unit independently respectively, (OA') It consists of the basis or oxyethylene unit which consists of repeat structure of an oxypropylene unit, and an oxypropylene unit. They show the basis which consists of structure arranged by the basis or block which consists of structure arranged at random, and; q and r are the integers of 2-40 independently respectively. q+r is 4-42 and; l and m are the integers of 0-20 independently respectively. 1+m -- the integer of 0-20 -- it is --; y -- 2 or 3 -- it is --; R9, and R10, R11 and R12 -- each --} whose; z it is the alkyl group, the phenyl group, benzyl, or cyclohexyl machine of carbon numbers 1-6 independently, and is the integer of 200-1000

[0011] (6) the above -- A -- a component -- 50 - 80 -- % of the weight -- B -- a component -- ten - 40 -- % of the weight -- and -- C -- a component -- three - 20 -- % of the weight -- containing -- fiber -- processing -- an agent -- fiber -- receiving -- 0.1 - 1.5 -- % of the weight -- adhering -- having had -- (-- five --) -- a term -- a publication -- heat -- an adhesive property -- a bicomponent fiber .

(7) A heat adhesive property bicomponent fiber given in (6) terms whose R A component which consists of polyoxyethylene alkyl ether shown by the general formula (1) is polyoxyethylene alkyl ether which x becomes from the integer of 20-40 in the hydrocarbon group of carbon numbers 12-30.

(8) The heat adhesive property bicomponent fiber whose rate of omission to which a cellulosic fiber drops out of the nonwoven

fabric is less than 25% when using together the heat adhesive property bicomponent fiber of a publication with a cellulosic fiber to either of the (1) - (7) terms, and it mixes with cotton, the 3 - 50 % of the weight of fiber and 97 - 50 % of the weight of cellulosic fibers are heated and it considers as a nonwoven fabric.

(9) The heat adhesive property bicomponent fiber whose rate of omission to which a cellulosic fiber drops out of the nonwoven fabric is less than 15% when using together the heat adhesive property bicomponent fiber of a publication with a cellulosic fiber to either of the (5) - (7) terms, and it mixes with cotton, the 3 - 50 % of the weight of fiber and 97 - 50 % of the weight of cellulosic fibers are heated and it considers as a nonwoven fabric.

(10) The fiber aggregate which mixed with cotton 3 - 50 % of the weight of heat adhesive property bicomponent fibers and 97 - 50 % of the weight of cellulosic fibers of a publication by the air RAID method to either of the (1) - (9) terms.

(11) The nonwoven fabric whose specific volume the rate of omission of a cellulosic fiber which heat-treats the fiber aggregate indicated by (10) terms, and is obtained by carrying out heat adhesion of the fiber intersection of a heat adhesive property bicomponent fiber is 25% or less, and is 40 or more cc/g.

(12) A nonwoven fabric given in (11) terms whose degree of initial absorptance is 5.9 or more.

(13) The laminating nonwoven fabric obtained by carrying out the laminating of the fiber aggregate of a publication, and other fiber aggregates to (10) terms, and carrying out heat adhesion of the heat adhesive property fiber.

(14) The laminating nonwoven fabric obtained by carrying out the laminating of the fiber aggregate of a publication, and other sheets to (10) terms, and carrying out heat adhesion of the heat adhesive property fiber.

(15) The wiper using the fiber aggregate, a nonwoven fabric, or a laminating nonwoven fabric given in either of the (10) - (14) terms.

(16) The absorber using the fiber aggregate, a nonwoven fabric, or a laminating nonwoven fabric given in either of the (10) - (14) terms.

[0012]

[Embodiments of the Invention] Hereafter, this invention is explained in detail. The heat adhesive property bicomponent fiber of this invention uses a conversion polyolefine as the 1st component, uses a resin with the melting point higher than the 1st component as the 2nd component, and is a bicomponent fiber by which this 1st component continues and comes to form a part of fiber front face [ at least ] in the length direction. The denaturant used for a conversion polyolefine is a vinyl monomer containing at least one sort chosen from a unsaturated carboxylic acid and its acid anhydride, can use as an indispensable component the unsaturated carboxylic acid specifically chosen from the maleic anhydride, the maleic acid, the acrylic acid, the methacrylic acid, etc., or its anhydride, and can also contain the other vinyl monomer. As the other vinyl monomer, it excelled in radical polymerization nature and general-purpose monomer use can be carried out.

[0013] For example, methacrylic esters, such as styrene, such as styrene and an alpha methyl styrene, a methyl methacrylate, an ethyl methacrylate, methacrylic-acid 2-hydroxyethyl, and dimethylaminoethyl methacrylate, or the same acrylic ester can be mentioned. The concentration in the conversion polyolefine of these vinyl monomers is 0.05-2 mols/kg. Among those, the total quantity of a unsaturated carboxylic acid or an acid anhydride is 0.03-2 mols/kg. The carboxylic acid or acid anhydride in a conversion polyolefine is a component which contributes to an adhesive property directly, and by helping uniform distribution into the polymer of an acid, with rescuing an adhesive property from the side, other vinyl monomers give polarity to a polar scarce polyolefine, improve compatibility with a cellulosic fiber, and also contribute to improvement in uniform distribution. The side chain which consists of a block copolymer by being able to perform carrying out the graft polymerization of these vinyl monomers to trunk polymer by the usual method, and it introducing the side chain which mixes a vinyl monomer with a unsaturated carboxylic acid or an acid anhydride to a polyolefine, and becomes it from a random copolymer using a radical initiator, or carrying out the polymerization of the different-species monomer one by one can be introduced.

[0014] As for the trunk polymer of a conversion polyolefine, polyethylene, polypropylene, and polybutene 1 grade are used. As polyethylene, high density, straight chain-like low density, and a low density polyethylene are used. These are the gay of density 0.90 - 0.97 g/cm<sup>3</sup>, or a copolymer with other alpha olefins, and the melting point is about 100-135-degree C polymer.

Polypropylene is the crystalline polymer of 130-170 degrees C of melting points, and is a copolymer with a gay or other olefins. A polybutene -1 is the crystalline polymer of 110-130 degrees C of melting points, and is a copolymer with a gay or other olefins. In these polymer, when the ease of the melting point range and a graft reaction is taken into consideration, polyethylene is desirable.

[0015] The conversion polyolefine used as the 1st component is single, and can be used as two or more sorts of mixture of the above-mentioned conversion polyolefine, or mixture of a conversion polyolefine and trunk polymer. What is necessary is just to go into the range whose content of the denaturant in polymer is 0.05-2 mols/kg, when it is the mixture of different-species polymer.

[0016] As a resin with the melting point higher than the 1st component used as the 2nd component, crystalline polymers, such as trunk polymer of the aforementioned conversion polyolefine or polyester, and a polyamide, can be used. In these polymer, a polypropylene homopolymer or ethylene, the butene-1 of the crystalline polypropylene copolymer which is a copolymer with an alpha olefin, etc. are desirable seen from the field of chemical resistance and the melting point.